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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,645	12/22/2000	Aman Gupta	GEMS8081.056	4526
27061	7590	04/19/2007	ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (GEMS) 136 S WISCONSIN ST PORT WASHINGTON, WI 53074	EXAMINER JEANTY, ROMAIN
			ART UNIT	PAPER NUMBER 3623
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/19/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/747,645	GUPTA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Romain Jeanty	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on January 22, 2007.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-27 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 - Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date: _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date: _____	6) <input type="checkbox"/> Other: _____

## **DETAILED ACTION**

1. This Office Action is in response to the communication received on January 22, 2007.

Claims 1-27 are pending in the application.

### **Response to Arguments**

2. Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

### **Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 4-6, 11-15, 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deleryd, Mats; "On the Gap between theory and practice of process capability studies", 1998, The International Journal of Quality and Reliability Management, Bradford, Vol. 15, Iss. 2 pg. 178, (hereinafter Deleryd) in view of "A SAS Institute White Paper: The Quality Data Warehouse – serving the analytical needs of the manufacturing enterprise", © 1999, SAS Institute, pp.1-11. (hereinafter SAS)

Regarding Claim 1, Deleryd teaches:

subtracting the customer requested date from the max ship date producing a difference value;

Page 4 paragraph 4, the process metric is subtracted from the target value T to produce a difference value (the examiner notes that “customer request date” and “max ship date” are considered non-functional descriptive material and do not further distinguish the claim.

determining a statistical calculation to indicate process quality using the shipment quality metric.

Page 4 paragraph 5,  $C_{pk}$  is a statistical calculation to indicate process quality ( $C_{pk}$  is a Process Capability metric). Also see page 3 para 6, process metrics can also be placed on control charts (i.e. x-bar and R charts) to indicate process quality – these charts also use a statistical calculation to indicate process quality.

Deleryd further teaches that standard six-sigma techniques assume that a process produces variation that is normally distributed, but that in reality most real-world processes produce results that are skewed (page 5 para 2 & 4).

Deleryd does not teach:

maintaining a database that contains fields indicating at least an order, a max ship date, a customer requested date, and a product category for each order;

fetching order information for all orders that have a valid max ship date;

adding a predetermined number of days to the difference value providing a shipment quality metric for each order; and

However, official Notice is taken that it is old and well known in the art to add a numerical offset to a process metric to handle skewness (i.e. adding a predetermined number of days to the difference value).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Deleryd, regarding providing process control measurement to data that is normally distributed, to add an offset to the data, because it would provide a better process model by taking into account skewness in the data.

SAS teaches:

maintaining a database that contains fields indicating at least an order, a max ship date, a customer requested date, and a product category for each order; page 3 column 1 para 2, data is collected (i.e. in a database – see Figure 2 on page 4) from transactional systems (i.e. including ERP systems that track sales orders).

Page 4 column 2 para 2, DataMarts/InfoMarts (i.e. databases) are maintained where the data is maintained in a consistent format (i.e. the datamart/infomart records contain fields. – see also page 5 column 1 para 2, the data format of the data mart and info mart is interpreted by the examiner to contain fields, since both a data mart and an info mart are databases).

The examiner notes that the specific field names are considered non-functional data and do not add patentable weight to the claim.

fetching order information for all orders that have a valid max ship date; page 5 column 1 para 2, a datamart / infomart provides for accessing information that was obtained from a transactional system (i.e. an ERP system). Since SAS teaches populating a info/data mart with ERP data, the retrieval of data for the analysis taught by SAS meets the claim limitation, because ERP data includes order and shipping information (see page 8 column 1 para 4 & page 2 column 2 para 2, shipment records are obtained.)

SAS teaches using statistical process control and analysis, thus SAS' teachings are analogous art to Deleryd.

SAS teaches that its data warehousing approach to storing data provides for a way to implement quality improvements across an enterprise because data is collected from disparate sources (page 1 column 2 para 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Deleryd, regarding applying six-sigma techniques to measuring process control, to include the database teachings of SAS, because it would enable six-sigma process control to applied across the enterprise.

The examiner notes above that the data above "an order, a max ship date, a customer requested date, and a product category" are nonfunctional data. Deleryd teaches analyzing process data as discussed above but not the data recited. However, these differences are only found in the non-functional descriptive material and are not functionally involved in the steps recited nor do they alter the recited structural elements; therefore, such differences do not effectively serve to patentably distinguish the claimed invention over the prior art. The recited method steps would be performed the same regardless of the specific data. Further, the structural elements remain the same regardless of the specific data. Thus, this descriptive material will not distinguish the claimed invention from the prior art in terms of patentability as the claimed invention fails to present a new and unobvious functional relationship between the descriptive material and the substrate, see *In re Gulack*, 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983); *In re Lowry*, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994) ); *In re Ngai*, 367 F.3d 1336, 1336, 70 USPQ2d 1862, 1863-64 (Fed. Cir. 2004); MPEP § 2106.

Regarding Claim 2, Deleryd teaches:

wherein the order information fetched is only for those orders that were placed within a given time period.

Page 3 para 8, data is gathered based on a given time period (i.e. a particular shift). The examiner notes that the term “orders” is non-functional descriptive material and does not add further patentable weight to the Claim.

Deleryd does not teach obtaining data from a database, however, as noted above, SAS teaches using a database to gather process information.

Deleryd and SAS are both addressing the use of data to improve quality via statistical methods, thus both Deleryd and SAS are analogous art.

SAS teaches that providing data from a database enables immediate analysis of the data, since it is in a format ready for analysis (page 8 column 1 para 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Deleryd, regarding obtaining data within a particular time period, to include the steps of obtaining the data from a database, as taught by SAS, because it would make the data analysis easier and more readily available, since the data is obtained from a database.

Regarding Claim 4, Deleryd teaches:

setting a value for at least one specification limit; and computing and displaying a statistical score based upon the specification limit and the shipment quality metrics, wherein said statistical score is a measure of process capability.

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Page 4 para 4, a process capability index is given that is based on a computation of USL and LSL (i.e. specification limits). This process capability index is a measure of process capability because the process is assumed to be capable if this figure is greater than 1.33.

Regarding Claim 5, Deleryd teaches:

wherein the steps following maintaining the database are repeated at regular time intervals.

Page 3 para 8, the process capability study is performed over a longer period of time (i.e. repeated at regular time intervals).

Regarding Claim 6, Deleryd teaches

wherein the statistical calculation is calculated and displayed for each product category.

Page 3 para 8, the statistical calculation is calculated for “homogenous set of data” i.e. from the same category. The examiner notes that the term ‘product’ is non-functional descriptive material.

Claims 11- 15 and 17-19 recite similar limitations as those recited in Claims 1, 2, 4-6 above, and are therefore rejected under the same rationale

5. Claims 3, 7, 9, 20-22, 24, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deleryd in view SAS and further in view of Davis, Robert D; et al.; “Detecting Process Shifts with X-bar charts”, First Quarter 1993, Production and Inventory Management Journal, 34, 1, ABI/INFORM Global, p.25 (hereinafter Davis)

Regarding Claim 3, Deleryd teaches:

determining a value for an upper specification limit and a lower specification limit; page 4 para 4, USL and LSL are defined as upper and lower specification limits.

Deleryd further teaches on page 4, para 4, the use of USL and LSL in combination with process sigma to measure dispersion, however Deleryd and SAS do not teach the use of a Z statistic to determine the percentage of nonconforming material as per:

displaying a percentage of times the shipment quality metric was greater than the upper specification limit; and displaying a percentage of times the shipment quality metric was less than the lower specification limit.

Davis teaches:

displaying a percentage of times the shipment quality metric was greater than the upper specification limit; and displaying a percentage of times the shipment quality metric was less than the lower specification limit.

Page 27 step 4, the calculation of a Z statistic determines the percentage of times (including for a million opportunities – note that Davis teaches PPM defects – see page that a quality metric is greater than a USL – the approach is the same as taught by Davis for using a Z-stat to determine the percentage of nonconforming product greater than a LSL – The percentage of product greater and lower than an USL and LSL are displayed by the graphs on page 26

Figure 1.

Davis, Deleryd and SAS all address using statistical methods to improve process quality, thus they are all analogous art.

Davis teaches that using the LSL and USL provide for showing when a process is producing material that is nonconforming by applying statistical principles that illustrate a normally distributed process (page 25 column 2 para 2, i.e. the statistical power in the X-bar chart).

One of ordinary skill in the art of six-sigma principles would have been motivated at the time of the invention to modify the collective teachings of Deleryd and SAS, regarding providing for a database that provides for process measurement and control using statistical principles, to calculate the percentage of nonconforming product using a Z-statistic, as taught by Davis, because it would provide a proven way to estimate nonconforming material based on the process capability.

Regarding Claim 7, Deleryd teaches using USL and LSL to determine process capability, however Deleryd and SAS do not teach using Z scores as per:

wherein the statistical score is calculated by using a formula given by:  $Z_{LT} = \min [(\text{USL} - \mu)/\sigma, (\mu - \text{LSL})/\sigma]$ ,

However, this teaching is shown by an obvious modification of Davis.

Davis teaches using a Z statistic to determine process capability where the difference between the specification limit (i.e. LSL and USL) and the process sample average (i.e.  $\mu$ ) is divided by the standard deviation (i.e.  $\sigma$ ) – Note step 5 on page 27 with the accompanying formula.

It would have been obvious to one of ordinary skill in the art to modify the collective teachings of Deleryd and SAS, to include the Z stat teachings of Davis, because these provide a way to predict process capability.

Davis further teaches that a process may shift its center point so that the bulk of the process observations are not centered exactly between the USL and LSL but are shifted (note Figure 1, b and d). Davis notes that this shift can occur both based on a change in  $\sigma$  (process variation) and a change in  $\mu$  (process average). Since Davis teaches that process shifts can drive

the tail of the distribution over either the LSL or USL and that the Z statistic measures the percentage of nonconforming material, it would be obvious to take the minimum Z stat of either the USL or LSL, because it is old and well known in the art of six-sigma that a smaller Z stat means that more defective product is being produced.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the collective teachings of Deleryd, SAS and Davis, to take a Z stat as being the minimum Z stat for the USL or LSL, because it would show which direction the process was moving with regards to the USL or LSL.

Regarding Claim 9, Deleryd, SAS and Davis do not teach:

wherein the method further comprises displaying said  $Z_{LT}$  value by displaying a scale representing a range of values for  $Z_{LT}$  with an overlapping needle to indicate current performance.

However, Official Notice is taken that displaying a metric using a scale and a needle is old and well known in the art (e.g. a speedometer needle). This provides an easy to use way to see how a metric is performing over a range of values.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the collective teachings of Deleryd, SAS and Davis to include the step of displaying the  $Z_{LT}$  metric using a needle indicator with a range of values, because it would provide an easy to use way to see a metric's performance.

Regarding Claim 21, Deleryd, SAS and Davis teach the limitations of measuring percentage of defects, as discussed above, however they do not teach defects as being measured

in PPM (parts per million). However this measurement is known in the art of Six-sigma as providing a meaningful and easy to understand measure of quality.

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the collective teachings of Deleryd, SAS and Davis, regarding measuring the percentage of defects, to measure the defects in PPM, because this is a well known and understood way to communicate defect rates.

Claims 20, 22, 24, 25 and 27 recite similar limitations to those addressed by the rejection of Claims 3, 7 and 9 above, and are therefore rejected under the same rationale.

6. Claims 8, 10, 16, 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deleryd in view of SAS, in view of Davis, and further in view of Harry, Mikel J; "Six Sigma: A breakthrough strategy for profitability", May 1998, Quality Progress, 31, 5; ABI/INFORM Global, p.60, (hereinafter Harry).

Regarding Claim 8, Deleryd, SAS and Davis do not teach:

wherein the method further comprises determining Z short-term by use of the formula  
 $Z_{ST} = Z_{LT} + 1.5$ .

However, in the art of Six-Sigma it is old and well known to model a short term Z by shifting the long term Z by 1.5, as evidenced by Harry.

Harry teaches that a short term estimation of Z (i.e. defect ppm) may be performed by shifting the long term Z 1.5 sigma (see page 61 column 1 para 1 and Figure 2 – note in Figure 2 that the process capability chart illustrates where a shorter design width is more likely to produce defects, however depending on the particular process, a shift may occur where the other Z, that is

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associated with the LSL, results in a short term Z increase of 1.5 – here on the chart it is shown as  $Z_{st} = 6 + 1.5 = 7.5$  sigma.).

Harry teaches that this estimation method is based on research that shows that a typical process is likely to deviate by 1.5 standard deviations (page 60 column 2 para 3) at any given moment in time.

It would have therefore been obvious to one of ordinary skill in the art to further modify the collective teachings of Deleryd, SAS and Davis, to further include the teachings of Harry, regarding estimating deviations in variation in a process, because this estimation of a short term Z statistic are based on research of a typical process and this approach is a proven way to estimate short term variation to better predict process capability.

Regarding Claim 10, Deleryd, SAS, Davis and Harry do not teach wherein the method further comprises graphically displaying the  $Z_{st}$  value by displaying a range of values with an overlapping needle to indicate current performance. However, Official Notice is taken that displaying a metric using a scale and a needle is old and well known in the art (e.g. a speedometer needle). This provides an easy to use way to see how a metric is performing over a range of values. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the collective teachings of Deleryd, SAS and Davis to include the step of displaying the  $Z_{ST}$  metric using a needle indicator with a range of values, because it would provide an easy to use way to see a metric's performance.

Claims 16, 23 and 26 recite similar limitations as those recited in Claim 8 above, and are therefore rejected under the same rationale.

### Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Benchmarking field services using a zero defects approach Ravi S. Behara, Jos G.A.M.. Lemmink. *The International Journal of Quality & Reliability Management*. Bradford:1997. Vol. 14, Iss. 5, p. 512-526.
- b. Six sigma, e-commerce pose new challenges Jenny Kendall, Donna O Fulenwider. *Quality Progress*. Milwaukee:Jul 2000. Vol. 33, Iss. 7, p. 31-37 (7 pp.)
- c. The power of Six Sigma in practice David Hutchins. *Quality Focus*. Bradford:Second Quarter 2000. Vol. 4, Iss. 2, p. 26-33 (8 pp.)
- d. Metrics for the Order Fulfillment Process (part 1) Arthur M Schneiderman, *Journal of Cost Management*. Summer 1996, Vol. 10. No. 2, p.c1-13. retrieved from the web at:  
[www.schneiderman.com/AMS\\_publications/Metrics%20for%20Order%20Fulfillment/OTD-1.doc](http://www.schneiderman.com/AMS_publications/Metrics%20for%20Order%20Fulfillment/OTD-1.doc)
- e. An Overview of Operational Excellence and Six Sigma in AlliedSignal Stephen A Zinkgraf, 1998, Quality Congress. ASQ's Annual Quality Congress Proceedings; ABI/INFORM Global. P.173.

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f. Defect Rate Estimation for "Six Sigma" Processes Timothy S Vaughn, Fourth Quarter 1998, Production and Inventory Management Journal, 39, 4; ABI/INFORM Global, p.5.

g. AlliedSignal Soars by building up suppliers Tim Minahan, Purchasing. Boston; Sep. 18, 1997. Vol 123, Iss. 4, pg.38 9 pgs. The Rise, Fall and Revival of Six Sigma Rob McClusky, Quality Focus; Second Quarter 2000; 4, 2; ABI/INFORM Global, p.6.

h. SPC Software (800) 635-5901 IQS, retrieved from web.archive.org's webpage of IQS.com from 6 October 2000, pp.1-2. Using dashboards and scorecards in a service industry Steven J Pautz. Quality Congress. ASQ's ... Annual Quality Congress Proceedings. Milwaukee:1998. p. 324 (7 pp).

i. Best practices: The joy of Six (Sigma) Robert J Bowman. Distribution. Radnor:Aug 1997. Vol. 96, Iss. 9, p. 62-67 (4 pp).

### **Conclusion**

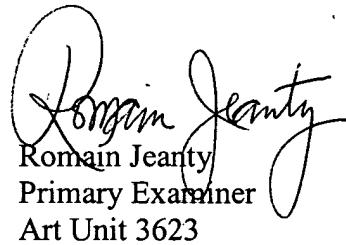
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Romain Jeanty whose telephone number is (571) 272-6732. The examiner can normally be reached on Mon-Thurs 7:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq R. Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

April 16, 2207



Romain Jeanty  
Primary Examiner  
Art Unit 3623